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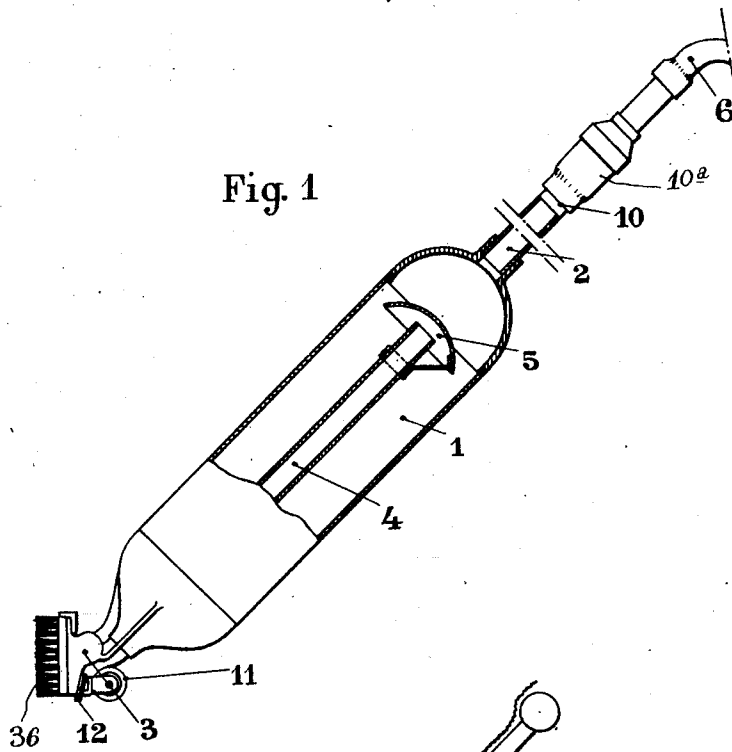
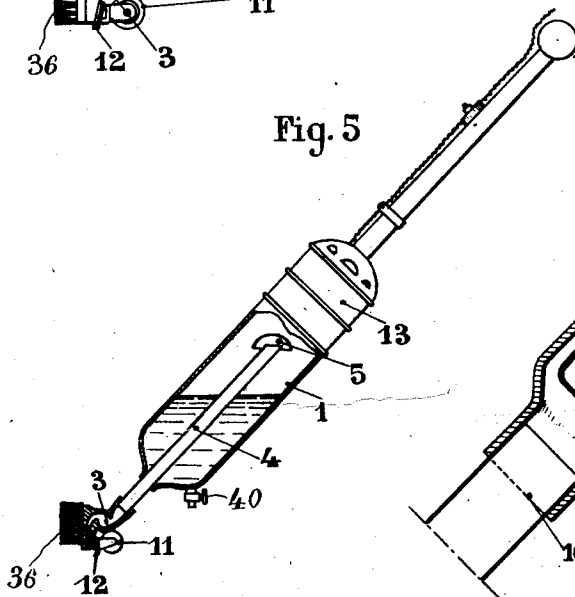
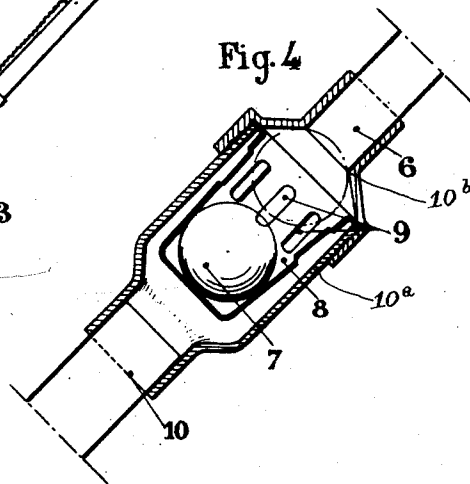
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P. BRETON

CLEANING MEANS

Filed Dec. 22, 1925

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

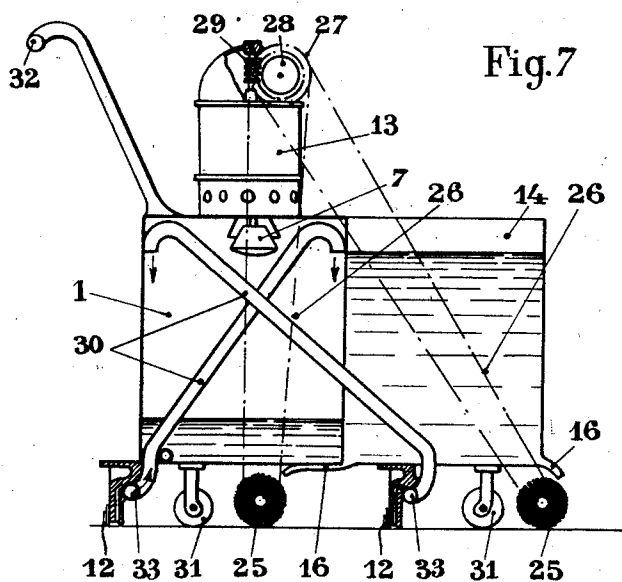


Fig. 7

Fig. 2

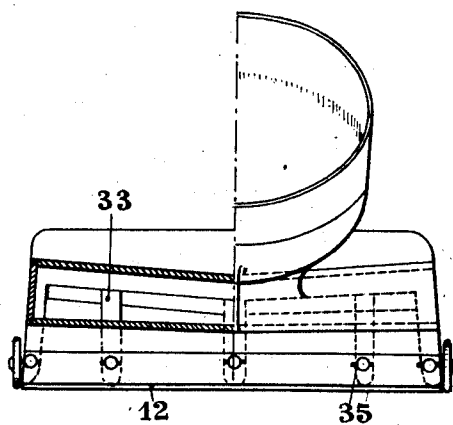
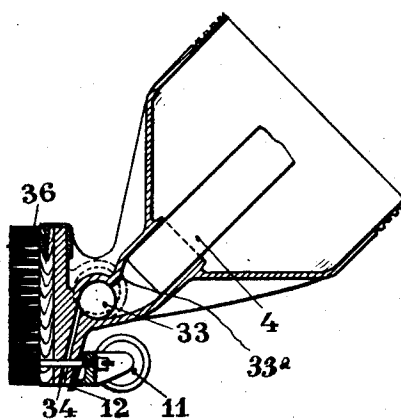


Fig. 3



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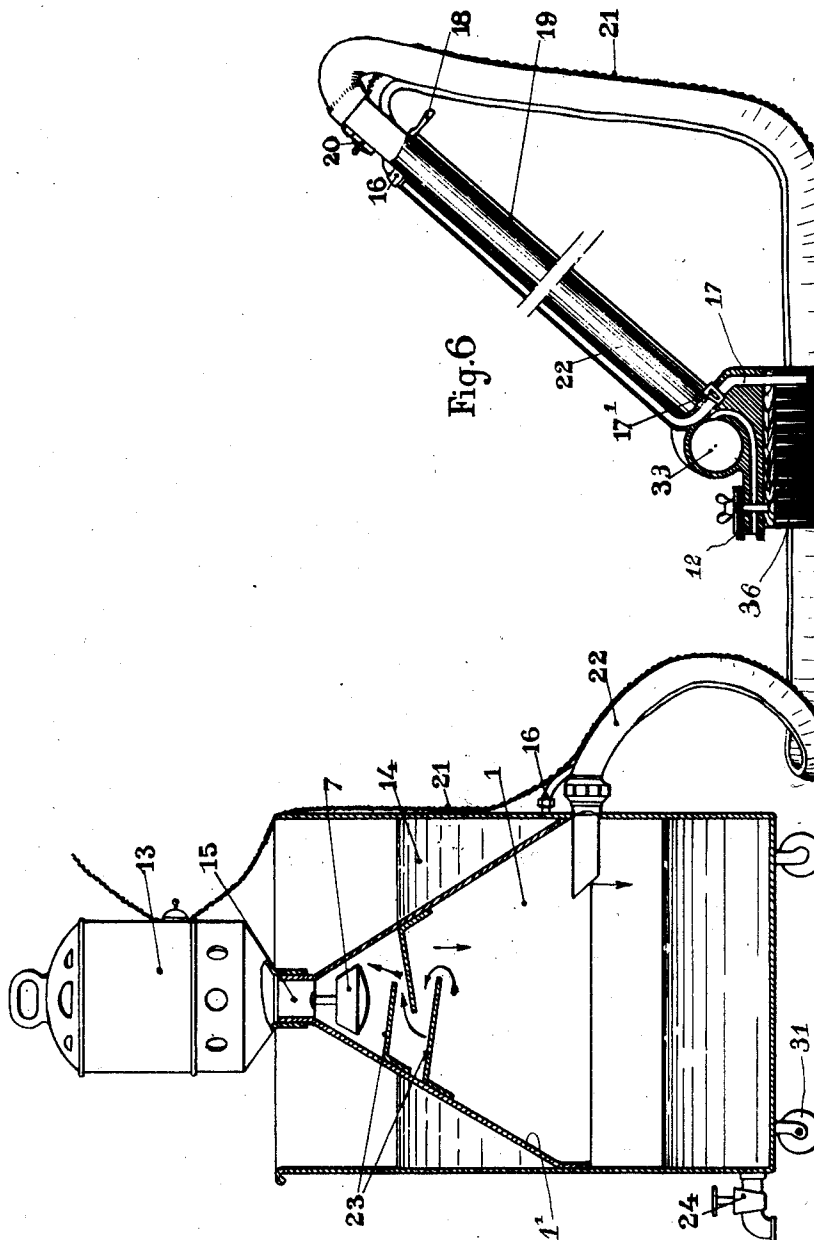
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

PAUL BRETON, OF BELLEVUE, FRANCE.

CLEANING MEANS.

Application filed December 22, 1925, Serial No. 76,951, and in France December 31, 1924.

The present invention relates to vacuum cleaning apparatus and aims to provide improved means for effecting the thorough cleansing of any surface.

The invention aims more particularly to provide means for cleaning relatively large surfaces such as floors or streets quickly, thoroughly and economically.

The invention also aims to provide means for scrubbing the surface to be cleaned just prior to the vacuum cleaning operation.

Another object of this invention is to provide means for removing liquids which may be used in carrying out a cleaning operation.

A further object is to provide a vacuum apparatus capable of handling air and water either separately or together as cleansing agents.

Still another object of this invention is to provide safety means for preventing liquids sucked into the apparatus from reaching the vacuum pump.

It is still further an object of this invention to provide means for preventing liquid once sucked into the apparatus from gaining an exit in the event that the suction is interrupted from any cause.

In order that the invention may be more clearly understood it will now be described in its various modifications with reference to the accompanying drawings, but it is to be understood that the description and drawings are merely illustrative.

Fig. 1 shows an elevation partially in section of one embodiment of the invention.

Fig. 2 is a view partially in section of the wiper and suction nozzle construction.

Fig. 3 is a section through the suction nozzle.

Fig. 4 is a section through the handle portion of an apparatus adapted for household use and of the type illustrated in Fig. 1 and shows in detail the valve construction for preventing flow of liquid into the vacuum pump chamber.

Fig. 5 is a view partially in section of an apparatus like that shown in Fig. 1 but with the vacuum pump mounted directly on the handle.

Fig. 6 shows a sectional elevation of an apparatus to be used for cleaning relatively large surfaces.

Fig. 7 is a sectional elevation of another embodiment of a large scale scrubbing and cleaning apparatus.

Referring now to Figures 1 to 5 of the drawings, 1 represents a receiver for air and liquid which is drawn into the apparatus through the suction nozzle 34 and the pipe 4. A baffle 5 is provided to deflect the liquid ascending through 4 into the receiver 1 and this baffle serves to prevent the liquid from being drawn into passage 2 leading to the vacuum pump. A valve 40 may be provided for emptying the receiving chamber. However, in the embodiment shown in Fig. 1, the vacuum pump 13 is not mounted on receiver 1, and hence the liquid can be readily removed from receiver 1 when the part 2 is disconnected therefrom.

The parts which directly perform the cleaning operations include a brush 36, a wiper or scraper 12 and a suction orifice or nozzle 34 mounted so as to constitute a single unit. If desired this cleaning unit may include in addition, a conduit for supplying cleaning fluid 17 as shown in Fig. 6. It is to be understood that this unitary arrangement of brush and suction nozzle is merely a preferred one in the embodiment shown. These elements may be arranged separately as in the modification represented in Fig. 7 of the suction nozzle may be mounted independently of the brush but preferably with the wiper. When the brush, wiper and suction nozzle are mounted together, the brush is preferably attached to the suction nozzle in a plane at right angles to the plane of the operating portions of the suction nozzle and the wiper, the receiving chamber and handle being in alignment, midway between the plane of the brush, and the plane of the outer ends of the wiper and of the suction nozzle. When it is desired to use the brush, the apparatus is turned to the position shown in Fig. 6 and when the wiper and suction nozzle are to be brought into operation, the apparatus is swung, or turned, on its handle as an axis through an angle of 180° or on the intersection of the abovementioned planes through an angle of 90°, into the position shown in Fig. 3. The wiper 12 is preferably made of rubber and is mounted just behind the suction nozzle 34 so as to direct the liquid toward the suction orifice. The assembly constituted by the receiving chamber and by the brush, wiper and suction nozzle is preferably mounted on wheels 11 to facilitate movement and functioning of the apparatus.

There are certain special improvements

made in the design of the suction nozzle to adapt it to the efficient handling of air, of mixtures of air and liquids or of liquids alone. These special improvements comprise

5 an exterior narrow suction passage 34 which communicates with an intermediate chamber 33 of relatively large dimensions above the bottom of said chamber when the device is in the position shown in Fig. 3. The suction

10 orifice is made to enter the chamber 33 preferably tangentially. The chamber 33 is provided with a discharge conduit 33^a which is constricted at the point where it connects with chamber 33. This constriction of conduit

15 33^a has the effect of increasing the velocity of fluids passing from chamber 33 into the discharge conduit. The discharge conduit is arranged to draw liquid accumulating in the bottom portion of chamber 33 and to deliver

20 the same through conduit 4 to receiving chamber 1.

The manner in which the suction orifice, the intermediate chamber and its discharge conduit cooperate is as follows. Air, mixtures

25 of air and liquid (water) or water alone are drawn through 34 and are deflected from the top of the chamber toward the bottom. The air laden with dust, etc., passes then directly into discharge conduit 33^a. If water alone

30 or a mixture of air and water is being drawn through 34, the water accumulates in the bottom of intermediate chamber 33 and, together with whatever air accompanies it, is then drawn into the discharge conduit and thence

35 into the liquid receiving chamber 1. When the suction is shut off or if it be interrupted from any cause there would be a tendency, normally, for liquid contained in tube 4 and conduit 33^a to descend and be discharged out-

40 wardly through the suction orifice 34 onto the surface which has just been cleaned. The intermediate chamber 33 however acts to prevent this. Whatever liquid descends is caught in that portion of chamber 33 below

45 the level of orifice 34.

Referring now to Figure 4 of the drawings, there is shown a special structure adapted to be attached more especially to an apparatus such as that shown in Fig. 1 which shows a

50 type suitable for household use. This structure is designed to come into operation when, for any reason, the apparatus is laid on the floor or is otherwise brought near enough to a horizontal position to permit the liquid ac-

55 cumulated in receiving chamber 1 to flow into the main suction producing portions of the apparatus. On Fig. 1, the portion to be protected is the suction tube 6. The use of the protective device shown in Fig. 4 is not

60 to be limited to the specific location shown in Fig. 1. The device proper comprises a shell adapted to be inserted between the suction tube 6 and the liquid receiving chamber 1 and it contains within the shell 10^a a cup 8

65 having perforations 9 near its upper end and

a float-ball 7 of wood or cork or of hollow metal or rubber construction. The shell 10^a is constricted near its upper end to provide a bearing surface 10^b for the float ball 7. From the construction of this device it is evi-

70 dent that, when the handle of the vacuum apparatus is in its normal raised position, air may pass freely through perforations 9 and there will be no impediment to the normal transmission of suction from one part of

75 the apparatus to another. When, from any cause, the handle is brought near, or to, a horizontal position and the liquid in receiving chamber 1 gains entrance through perforations 9 to the cup 8, float-ball 7 will float

80 from the position shown in solid lines in Fig. 4 to the position shown in dotted lines and will prevent the liquid from passing into the conduit 6. When the apparatus is again

85 elevated toward the vertical position the water below float-ball 7 will drain back through perforations 9 and shell 10^a into receiving chamber 1, the float-ball will sink to the bottom of cup 8 and suction will be re-

90 established through suction tube 6, perforations 9 and shell 10^a.

Referring now to the large scale movable apparatus shown in Figs. 6 and 7, it will be noted that each of the machines represented is equipped with the suction-nozzle, inter-

95 mediate chamber and constricted discharge conduit of special design which has already been described. Each machine is also fitted with a wiper for removing surplus liquid from the surface being cleaned and for directing this liquid toward the suction orifices. In the machine illustrated in Fig. 6 there is provided a conduit 17 which supplies

100 cleaning fluid to the brush 36 from flexible tube 16 connected to reservoir 14. A valve 17¹, operated by rod 18 connected to the handle of the machine and turned by extension 18 controls the flow of liquid in 17. Intermedi-

105 ate chamber 33 is emptied by flexible suction conduit 22 which discharges into the receiving chamber 1 for the dirty liquid. Baffles 23 are provided for preventing spray discharging from 22 from entering the vacuum pump

110 13. A discharge valve 24 for the receiving chamber 1 is provided and also a protective float valve 7 which moves upward to close conduit 15 leading to the vacuum pump when the level of the liquid, through neglect or otherwise, rises in chamber 1 to the conduit

115 level. An electric cable 21 connected to the vacuum pump 13 terminates at a control switch 20 located on the handle of the machine near the control 18 for the clean liquid supply. The receiver 1 and the reservoir 14 are advantageously constructed as shown in

120 Fig. 6, so that the first consists of the lower part of a cylindrical vessel, and the second of the upper part of the same vessel, the second vessel, 14, being separated from the first by means of a conical wall 1¹ and being fur-

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thermore preferably made of smaller size than the first to prevent an excess of liquid from being drawn in.

In the machine represented in Fig. 7, which is especially adapted for street cleaning and the like, rotary brushes 25 are provided preferably driven by belts or chains 26 from pulley 27 geared at 29 to the vacuum pump motor 13. Cleaning fluid is delivered from the reservoir 14 through distributors 16 to the brushes. Wipers 12 and the suction nozzles draw up the dirty liquid and deliver it through conduits 30 to receiving chamber 1. Conduits 30, it should be noted, are bent at their discharge ends to deliver the liquid in a direction away from the vacuum pump. A dirty-water discharge may be provided as shown in Fig. 6 and a safety-float valve 7. The whole apparatus is suitably mounted on wheels 31.

From the foregoing description it will be evident that there has been provided a vacuum apparatus capable of utilizing either air or water or both as cleansing agents. Special means have been provided for separating the liquids sucked into the apparatus from the gases and supplementary safety devices have been shown for still further insuring the exclusion of liquids from the vacuum producing of the apparatus. The invention, in its various embodiments, is adapted to thoroughly scrub and clean areas either large or small.

I do not intend to limit myself to the particular structures herein described but wish

to secure protection for any constructions which may fairly fall within the spirit of the foregoing disclosure.

What I claim is:—

1. A vacuum cleaning apparatus comprising in combination a collecting chamber having curved walls, a suction nozzle communicating with said chamber so as to discharge fluids substantially tangentially to a wall thereof and above the level of the bottom of said chamber, an aspirating conduit making connection substantially tangentially with a wall of said chamber and adjacent the bottom thereof, said conduit being constricted at the point where it communicates with the chamber, and means for applying suction to said aspirating conduit.

2. A vacuum cleansing device adapted to handle liquids comprising a suction nozzle, a collecting chamber connected to the suction nozzle, a suction conduit adapted to aspirate air contained in said collecting chamber, means formed with a passageway connecting said conduit and said chamber, and a float interposed in said means, said float operating to seal the inlet end of said conduit thereby preventing passage of liquid from the collecting chamber into the suction conduit when the liquid level in said chamber rises above the position of the inlet end of the suction conduit.

In testimony whereof I hereunto affix my signature.

PAUL BRETON.